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Description of the invention

1. Name of the invention

Mushroom Freshness Preservation method and Preservation Agent

2. Scope of the claims of the invention

1. Mushroom freshness preservation method characterized by the fact that the mushrooms are immersed in a water solution or aqueous dispersion of only one type of polyvalent alcohol aliphatic acid ester or of two or more types.
2. Mushroom preservation method according to the above described Claim 1 of the present invention where the polyvalent alcohol is a polysugar, glycerine, polyglycerine or sorbit.
3. Mushroom preservation agent that has as its effective component the polyvalent alcohol aliphatic acid ester according to the above described Claim 1 or Claim 2.

3. Detailed explanation of the invention

(Technological sphere of application)

The present invention is an invention about a mushroom freshness preservation method and a freshness preservation agent.

[Previous technology]

In the past, it has been difficult to artificially cultivate the mushrooms that are maitake family fungus derived type mushrooms. However, most recently, together with the development of the cultivation technologies, they have become produced in large volume and it has been possible to have them as a usual staple at the dining table. However, as the freshness preservation means, that is undertaken during their usual circulation, because of cost considerations, only transportation at low temperature and simple film packaging, have been performed. These measures are not sufficient in order to preserve the freshness of the mushrooms, and not only that, but also, it is necessary to provide a packaging material and cooled transportation equipment, etc. Because of that, the invention of a simple, inexpensive freshness preservation technology, is desirable.

[Problems solved by the present invention]

The present invention has taken into consideration the above described situation and it has made its problem to solve the problem of inventing a mushroom freshness preservation method (means), that is inexpensive, does not require capital, and not only that, but also, is easily implemented in practice.

[Measures in order to solve the problem]**(Summary)**

The authors of the present invention have conducted rigorous research in order to solve the above described problem, and from the accumulated results, they have observed that polyvalent aliphatic acid esters are effective in preserving the freshness of mushrooms.

The present invention is based on this knowledge, and it contains as its essential elements a mushroom freshness preservation method characterized by the fact that the mushrooms are immersed in a water solution or aqueous dispersion of only one type of polyvalent alcohol aliphatic acid ester or of two or more types, and a mushroom preservation agent that has as its effective component the polyvalent alcohol aliphatic acid ester.

(Polyvalent alcohol aliphatic acid ester)

As the polyvalent alcohol that forms the structure of the polyvalent alcohol aliphatic acid ester according to the present invention, for example, it is possible to point out as examples, the following materials: glycerine, D, L-toreite, erythrite, D, L-arabit, ribit, xylit, D, L-sorbit, D, L-manit, D, L-izide, D, L-talid, galactite, arit, maltit, etc., sugar alcohol type materials; or sorbitane, etc., their in-molecule anhydrous materials, or polyglycerine, etc., their polymeric materials; xylose, glucose, fructose, sorbose, maltose, galactose, polysugars, etc. However, in practice, polysugars, glycerine, polyglycerine, and sorbit, are preferred. Also, as the aliphatic acid, for example, it is possible to point out as examples, caprinic acid, caprylic acid, laurinic acid, palmitic acid, stearic acid, aracinic acid, behenic acid, oleic acid, linolic acid, etc., saturated or unsaturated, medium to high homologous order aliphatic acids.

Regarding the esterification, it is sufficient if it is conducted on part of the hydroxyl radicals of the alcohol, however even when the number of the free hydroxyl radicals is decreased, and it becomes difficult to be dissolved in water, it can be used as it is dispersed in the water.

(Used concentrations)

The above described aliphatic acid ester is used in a state where depending on the goals, one type is used, or two or more types are combined, and it is employed in a state as a water solution or an aqueous dispersion, and its concentration is usually, in the range of 0.01 ~ 10 %, and preferably, it is in the range of 0.1 ~ 2 %. Therefore, regarding the above described concentration, from a production operation point of view, because of the fact that the homogeneous wetting inside the numerous crevices of the surface area of the immersed mushrooms, is a prerequisite, if it is acceptable that the treatment time is long, it is a good option if a lower concentration is used.

(Preparation of the immersion solution)

At the time of the preparation of the aliphatic acid ester aqueous solution or aqueous dispersion according to the present invention, in the case of a single aliphatic acid ester aqueous solution or aqueous dispersion, it is a good option if simply the above ester material is dissolved or dispersed in water. However, in the case when an aqueous solution or an aqueous dispersion of

a composite composition is to be prepared, it is a good option if the material obtained as the two or more types of polyvalent alcohol aliphatic acid esters are melted and mixed in advance, and this material is then pulverized and it is dissolved or dispersed in water, or it is also a good option if the powder materials of the predetermined aliphatic acid ester materials, are mixed and this is then dissolved or dispersed in the water. Moreover, in order to increase the stability properties of the aqueous solution or the aqueous dispersion, it is also possible to use together with that a stabilization agent like sodium carboxymethyl cellulose, xantane rubber, guar rubber, sodium arginate etc.

[Effect]

According to the present invention, by only immersing the mushrooms in an aqueous solution or in an aqueous dispersion of polyvalent alcohol aliphatic acid ester(s), the surface treated mushrooms are preserved in a fresh state. The reason for that is not completely understood at the present time, however, it is suggested that its effective function is probably due to the fact that a thin layer of the above described aliphatic acid ester regulates the breathing of the plant body, and at the same time, it eliminates the evaporation of the water content.

At any rate, in the case of the present method, the method itself is simple, and also, there are no capital expenses, and because of that, it is an epoch-making technology as a mushroom freshness preservation method. Moreover, the results according to the present invention are much improved over the results obtained by the used according to the previous technology low temperature transportation and/or film packaging method used together.

[Practical Example 1]

Here below, the present invention will be explained in further details by using practical implementation examples and reference examples, however, the examples shown are only used for the explanation, and they do not have a direct relationship to the technological scope of the present invention.

Practical Examples 1 ~ 5 and Reference Example

10 grams of each of the powder materials of the experimental materials a ~ e with compositions according to the table below, were correspondingly

dissolved or dispersed in 1000 ml of distilled water, and the aqueous solution or aqueous dispersion, were produced. In these, only the collected mushrooms were immersed, and after that these were taken out, and they were stored under conditions of a temperature of 20°C and a relative humidity of 90 %. Moreover, as a reference example, mushrooms were compared that have been immersed in distilled water only. The results are presented in the table – 1, shown here below.

Experimental Material	Components	Weight Parts
A	Polysugar aliphatic acid ester	100
B	Glycerine monoaliphatic acid ester	100
C	Polyglycerine aliphatic acid ester	100
D	Polysugar aliphatic acid ester	50
	Sorbitane aliphatic acid ester	50
E	Polysugar aliphatic acid ester	60
	Sorbitane aliphatic acid ester	10
	Polysugar aliphatic acid ester	30
	Glycerine monoaliphatic acid ester	
	Sodium carboxymethyl cellulose	

Table 1

Practical Experiment	Exp. Material	Eating feel and appearance	Number of Days passed (days)	Number of Days passed (days)	Number of Days passed (days)	Number of Days passed (days)
			1	2	3	4
1	A	Smell Hardness Spore Scattering	Good Hard none	Good Hard none	Good Hard none	Good Somewhat hard none
2	b	Smell Hardness Spore Scattering	Good Hard none	Good Hard none	Good Hard none	Good Somewhat hard none
3	C	Smell Hardness Spore Scattering	Good Hard None	Good Hard None	Good Hard none	Good Somewhat hard none
4	D	Smell Hardness Spore Scattering	Good Hard None	Good Hard None	Good Hard none	Good Somewhat hard none
5	E	Smell Hardness Spore Scattering	Good Hard None	Good Hard None	Good Hard None	Good Hard None
Reference Example	Distilled water	Smell Hardness Spore Scattering	Good Hard None	Somewhat good Somewhat hard There is some	Not good Somewhat soft There is	Not good Somewhat soft There is

The eating feel and the appearance are evaluated by a 5 member panel.

According to the results presented in table - 1, in the case of the mushrooms that have been treated in an aqueous solution or aqueous dispersion of polyvalent alcohol aliphatic acid ester, according to the present invention, even after 4 days, a sufficient freshness was preserved so that there was no spore scattering, and there was sufficient resistance to smell and the hardness was sufficient for eating. However, in the case of the mushrooms that have been used as a reference example and that have been immersed only in distilled water, after 2 days, already there was a beginning of spore scattering, and after 3 days, they have become in a state that is not appropriate for eating. From these results, the results according to the present invention are clarified.

[Results according to the present invention]

The present invention is an invention that suggests an inexpensive method that is effective in preserving the freshness of mushrooms, where a high cost equipment and installations, are not required, and it is an invention that suggests a freshness preservation agent, and by that it causes an improvement in the activities of the related operational personal and the food hygiene.

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